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PRELIMINARY REPORT ON TORNADOES IN THE UNITED STATES DURING 1944

By J. L. BALDWIN

[Weather Bureau, Washington, D. C.]

THE tabulations for 1944 as shown in table 1 were derived from data on "Severe Local Storms" appearing in the MONTHLY WEATHER REVIEW and in monthly CLIMATOLOGICAL DATA of the various sections of the United States. They show the approximate monthly and annual number of tornadoes and the deaths, injuries, and property damage caused by them in the several States and in the country as a whole. A final and more complete report will appear in the UNITED STATES METEOROLOGICAL YEARBOOK, 1944.

The total number of tornadoes reported during 1944 was 160, or 15 more than the average. Of these 45 occurred in April. This relatively large monthly number is due to the series of tornadoes that occurred in Kansas, Oklahoma, and adjoining areas about the 9th and 10th of that month. The month of greatest tornadic activity is generally May, when the usual number is about 31, or only 5 less than occurred this May. During the 3 months from April to June, 113, or seven-tenths of this year's total, were reported. Tornadoes appeared in 29 States, all east of the Rocky Mountains, except a mild, questionable tornado on November 11 in California. These storms were the most widespread in June when reported from 14 States, extending from Montana and Texas to Minnesota and Maryland. None were noted in December.

There were 273 deaths or 2⁷ more than the average toll of these twisters; about 1,734 people were injured. Most of the deaths occurred during May and June, especially on the evening of June 23 when 153 lost their lives in southwestern Pennsylvania, northern West Virginia and Maryland. These areas were rather thinly settled, thus preventing a much greater loss of life. No deaths were attributed to approximately 26 tornadoes in Kansas and only 3 to about 29 of these storms in Iowa.

Property damage for the year was approximately \$16,827,600, which is about \$5,600,000 more than the usual destruction. More than three-fourths of this occurred in April and June, with none in December and practically none in October. About one-third of the total damage was caused by the Pennsylvania-West Virginia-Maryland tornadoes of June 23.

The most severe and destructive tornadoes of 1944 occurred in southwestern Pennsylvania, northern West Virginia, and Maryland on the evening of June 23. This intense tornadic activity was most unusual in that it persisted over rugged terrain, where storms of this severity rarely occur. Only 6 relatively mild tornadoes are on record as having ever occurred before in West Virginia. Pennsylvania averages about 1½ tornadoes per year, and even here the closest similarity was on August 19, 1890 when 16 lives were lost as a tornado passed through Wilkes-Barre.

These tornadoes were associated with the rapid eastward movement of an active cold front over these areas.

A survey was made by the Weather Bureau Office, Pittsburgh, Pa., from which much of the following on these tornadoes has been extracted. Observers who witnessed the paths of the tornadoes from the air stated that there were some meanderings but the general direction was from northwest to southeast, and the paths looked as though huge rollers had flattened everything in their way. The four main paths were from northwest of Shinnston, W. Va., to the mountains southeast of Montrose, W. Va. (40 miles); vicinity of Wellsburg, W. Va., to mountains southeast of Deer Park, Md. (80 miles); Ravenna, Ohio, possibly to Cambridge, Md., but at widely separated points, with major damage from Pittsburgh to Somerset, Pa., over a distance of 50 miles; Rural Valley to Twin Rocks, Pa. (25 miles). These tornadoes apparently moved almost simultaneously at 30 to 40 miles per hour along nearly parallel paths between 6:30 and 9:30 p. m., on June 23, dissipating on reaching the high range of the Alleghenies. Local tornadoes, also moving southeastward, occurred at Thomas, W. Va., and in Maryland at Frostburg, near Olney, and at Laurel. It is doubtful that the severe tornado which struck Cambridge over in Dorchester County, Md., at 11:15 p. m. E. S. T., and moved about 28 miles southeastward to Delmar could have been the same one that began at Ravenna, Ohio.

The American Red Cross reported 153 persons killed, 846 seriously injured, 1,686 families affected, 404 homes destroyed, 821 other buildings destroyed, 691 homes damaged and 765 other buildings damaged. Of the deaths, 103 occurred in West Virginia, 45 in southwestern Pennsylvania and 5 in Maryland. The total property damage approximated \$5,160,000, of which \$2,000,000 occurred in West Virginia, \$2,000,000 in Pennsylvania, and \$1,160,000 in Maryland. The major loss of life occurred at Shinnston, Flemington, Meadowville, Montrose, and Thomas in West Virginia; Chartiers, McKeesport, and Smithfield, in Pennsylvania; and Oakland and Cambridge in Maryland. These were the only sizeable towns in their paths.

On June 22, the day preceding the above storms, another tornado in connection with the same low-pressure system, killed 7 people, injured 65 and destroyed property valued at \$1,025,000 in southern Wisconsin; then it crossed into northern Illinois where 2 more people were killed, 15 injured and \$400,000 worth of property destroyed.

During the evening of June 16 a group of small tornadoes injured two persons and caused \$1,000,000 property damage in Iowa. The slow movement of one of these funnels was especially interesting. At the first

farm where damage was done it appeared to remain nearly stationary for 10 to 20 minutes. Later it turned southeast for about 3 miles, then made a U-turn, first going south, then east, then north, and finally heading back toward the east. It was reported that it also remained whirling in the same position at two other farms for 10 and 5 minutes respectively.

At about 6:30 p. m., on April 8, a tornado, moving from west to east over a path $2\frac{1}{2} \times 10$ miles killed 1 per-

son, injured 7, and caused \$1,000,000 property damage near Pottsville, Hamilton County, Tex. Another quite severe tornado struck New Holland, a suburb of Gainesville, Ga., early on April 16, and moved eastward into South Carolina, where it caused considerable destruction in and around Greenwood. In Georgia, 23 lives were lost and \$1,000,000 worth of property, while in South Carolina 18 people were killed, 116 injured and property valued at \$300,000 was destroyed.

TABLE 1.—Tornadoes and probable tornadoes

State*	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Alabama:													
Number			4	2									6
Deaths			5	2									7
Injuries			63	20									83
Damage (\$ × 1,000)			480.4	150.0									630.4
Arkansas:													
Number				5									5
Deaths				44									44
Injuries				331									331
Damage (\$ × 1,000)				700.0									700.0
California:													
Number											1		1
Deaths											0		0
Injuries											0		0
Damage (\$ × 1,000)											75.0		75.0
Florida:													
Number			2					2		3			7
Deaths			0					0		0			0
Injuries			0					0		0			0
Damage (\$ × 1,000)			10.0					(?)		(?)			* 10.0
Georgia:													
Number		2		4									6
Deaths		0		24									24
Injuries		0		(1)									(1)
Damage (\$ × 1,000)		50.0		1,660.0									1,610.0
Illinois:													
Number						1							1
Deaths						2							2
Injuries						15							15
Damage (\$ × 1,000)						400.0							400.0
Indiana:													
Number				3									3
Deaths				0									0
Injuries				0									0
Damage (\$ × 1,000)				7.0									7.0
Iowa:													
Number				1	16	9	1	2					29
Deaths				0	3	0	0	0					3
Injuries				0	30	0	1	0					31
Damage (\$ × 1,000)				20.0	1,000.0	* 1,075.0	(?)	29.0					* 2,124.0
Kansas:													
Number			1	11	1	6	5	1		1			26
Deaths			0	0	0	0	0	0		0			0
Injuries			1	3	0	0	0	0		0			4
Damage (\$ × 1,000)			1.0	311.6	2.0	50.8	50.0	15.0		73.2			503.6
Louisiana:													
Number		1			1								2
Deaths		1			2								3
Injuries		4			8								12
Damage (\$ × 1,000)		(?)			(?)								(?)
Maryland and Delaware:													
Number						5							5
Deaths						5							5
Injuries						60							60
Damage (\$ × 1,000)						1,160.0							1,160.0
Minnesota:													
Number						2	1	1					4
Deaths						0	0	0					0
Injuries						6	0	0					6
Damage (\$ × 1,000)						500.0	10.0	(?)					(?) 510.0
Missouri:													
Number				2									2
Deaths				0									0
Injuries				8									8
Damage (\$ × 1,000)				50.0									50.0
Montana:													
Number						1							1
Deaths						0							0
Injuries						0							0
Damage (\$ × 1,000)						(?)							(?)
Nebraska:													
Number		1			3								4
Deaths		0			0								0
Injuries		0			1								1
Damage (\$ × 1,000)		1.8			177.0								178.8
New Mexico:													
Number									1				1
Deaths									0				0
Injuries									0				0
Damage (\$ × 1,000)									25.0				25.0
North Carolina:													
Number				1									2
Deaths				0									0
Injuries				8									8
Damage (\$ × 1,000)				225.0					50.0				275.0
North Dakota:													
Number					5	3							8
Deaths					0	0							0
Injuries					0	0							0
Damage (\$ × 1,000)					6.0	(?)							* 6.0

See footnotes at end of table.

TABLE 1.—Tornadoes and probable tornadoes—Continued

State*	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Ohio:													
Number.....			1			2							3
Deaths.....			0			0							0
Injuries.....			0			0							0
Damage (\$×1,000).....			3.0			(?)							* 3.0
Oklahoma:													
Number.....	3	1	2	10	3						1		20
Deaths.....	2	0	0	1	0						0		3
Injuries.....	27	0	35	16	2						5		85
Damage (\$×1,000).....	155.0	150.0	150.0	568.2	32.5						35.0		1,090.7
Pennsylvania:													
Number.....						3			1				4
Deaths.....						45			0				45
Injuries.....						412			0				412
Damage (\$×1,000).....						2,000.0			50.0				2,050.0
South Carolina:													
Number.....			1	5									6
Deaths.....			0	19									19
Injuries.....			0	120									120
Damage (\$×1,000).....			10.0	314.0									324.0
South Dakota:													
Number.....							2						2
Deaths.....							0						0
Injuries.....							3						3
Damage (\$×1,000).....							200.0						200.0
Tennessee:													
Number.....				1		1							2
Deaths.....				0		0							1
Injuries.....				0		3							3
Damage (\$×1,000).....				40.0		(?)							* 40.0
Texas:													
Number.....				2	2	1							5
Deaths.....				1	3	0							4
Injuries.....				7	8	1							16
Damage (\$×1,000).....				1,001.1	107.0	(?)							* 1,108.1
Virginia:													
Number.....			2	1									3
Deaths.....			0	3									3
Injuries.....			36	0									36
Damage (\$×1,000).....			650.0	5.0									655.0
West Virginia:													
Number.....						3							3
Deaths.....						103							103
Injuries.....						430							430
Damage (\$×1,000).....						2,000.0							2,000.0
Wisconsin:													
Number.....						3	1						4
Deaths.....						7	0						7
Injuries.....						65	0						65
Damage (\$×1,000).....						1,065.0	20.0						1,085.0
Wyoming:													
Number.....					2	2		1					5
Deaths.....					0	0		0					0
Injuries.....					5	0		0					5
Damage (\$×1,000).....					5.0	2.0		(?)					7.0
United States:													
†Number.....	3	5	13	45	32	36	10	7	4	3	2	0	160
Deaths.....	2	1	5	95	8	162	0	0	0	0	0	0	273
Injuries.....	27	4	135	513	54	992	4	0	0	0	5	0	1,734
Damage (\$×1,000).....	155.0	* 201.8	1,304.4	4,951.9	1,329.5	* 8,252.8	* 280.0	* 44.0	198.2	(?)	110.0	0	* 16,827.6

* None reported for States not listed.

† Corrected for boundary crossing tornadoes.

! Many.

‡ Slight.

§ Several thousand.

¶ Considerable.

* Includes some straight wind, hail and water damage.

* Additional damage not included.